

We claim:

1. A method of encoding field values into a network frame for network transmission, comprising:
  - receiving at least one protocol data unit name and at least one value corresponding to at least one keyword associated with the at least one protocol data unit name;
  - retrieving protocol knowledge of the data structure of the at least one protocol data unit name enabling the building of the at least one keyword into at least one protocol data unit;
  - associating the at least one value with the at least one keyword; and
  - placing the at least one protocol value into a memory device in at least one protocol data unit data structure.
2. The method of claim 1 wherein the at least one keyword is at least one field keyword.
3. The method of claim 1 wherein the at least one keyword is a payload keyword and at least one field keyword.
4. The method of claim 1 wherein the at least one keyword is a header keyword and at least one field keyword.

5. The method of claim 1 wherein the at least one keyword is a header keyword, a payload keyword, a trailer keyword, and at least one field keyword.

6. The method of claim 1 wherein the protocol knowledge further comprises default values corresponding to the at least one keyword.

7. A method of encoding field values into a network frame for network transmission, comprising:

receiving at least two protocol data unit names, an order in which the at least two protocol data unit names are to be stacked; and at least one value corresponding to at least one keyword associated with one of the at least two protocol data unit names;

retrieving protocol knowledge of the at least two protocol data unit names enabling the building of the at least one keyword into one of the at least two protocol data units;

associating the at least one value with the at least one keyword;

placing the at least one protocol value in one of the at least two protocol data unit data structures; and

placing the at least two protocol data units into a memory device according to the order in which the two protocol data units are to be stacked.

8. The method of claim 7 wherein the at least one keyword is at least one field keyword.

9. The method of claim 7 wherein the at least one keyword is a payload keyword and at least one field keyword.

10. The method of claim 7 wherein the at least one keyword is a header keyword and at least one field keyword.

11. The method of claim 7 wherein the at least one keyword is a header keyword, a payload keyword, a trailer keyword, and at least one field keyword.

12. The method of claim 7 wherein the protocol knowledge further comprises default values corresponding to the at least one keyword.

13. A computer system including an encoder system for transmitting a network frame, containing protocol data units, to a network, the computer system comprising:

a user interface;

a network connection;

an encoder system disposed between the user interface and the network connection, the encoder system including:

a protocol library having protocol knowledge of the data structure of at least one protocol data unit name enabling the building of at least one keyword into at least one protocol data unit; and

a protocol encoder connected to the protocol library, the network connection, and the user interface for receiving at least one protocol data unit name and at least one value corresponding to the at least one keyword associated with the at least one protocol data unit name and placing the at least one value into a memory device in at least one protocol data unit structure.

14. The computer system of claim 13 operable as a network analyzer.

15. Apparatus for encoding field values into a network frame for network transmission, comprising:

means for receiving at least one protocol data unit name and at least one value corresponding to at least one keyword associated with the at least one protocol data unit name;

means for retrieving protocol knowledge of the data structure of the at least one protocol data unit name enabling the building of the at least one keyword into at least one protocol data unit;

means for associating the at least one value with the at least one keyword; and

means for placing the at least one protocol value into a memory device in at least one protocol data unit data structure.

16. A computer-readable medium whose contents cause a computer system to encode field values into a network frame for network transmission, by a method comprising:

receiving at least one protocol data unit name and at least one value corresponding to at least one keyword associated with the at least one protocol data unit name;

retrieving protocol knowledge of the data structure of the at least one protocol data unit name enabling the building of the at least one keyword into at least one protocol data unit;

associating the at least one value with the at least one keyword; and

placing the at least one protocol value into a memory device in at least one protocol data unit data structure.

17. A computer readable memory system encoded with a protocol library, the protocol library including:

at least one field keyword defining a field of a protocol data unit of a network frame, the at least one field keyword representing a number of fields that a protocol data unit may contain and the location of the field in the protocol data unit, the field being associated with one of the at least one field keywords.

18. The computer readable memory system of claim 17 further including:

at least one header field keyword defining a header field of a protocol data unit of a network frame, the header field keyword representing a header field that a network frame may contain and the location of the header field in the network frame, the header field being associated with the header field keyword.

19. The computer readable memory system of claim 18 further including:

at least one trailer field keyword defining a trailer field of a protocol data unit of a network frame, the trailer field keyword representing a trailer field that a network frame may contain and the location of the trailer field in the network frame, the trailer field being associated with the trailer field keyword.

20. The computer readable memory system of claim 18 further including:

at least one payload field keyword defining a payload field of a protocol data unit of a network frame, the payload field keyword representing a payload field that a network frame may contain and the location of the payload field in the network frame, the payload field being associated with the payload field keyword.

21. The computer readable memory system of claim 20 further including:

length keywords specifying length parameters of associated header keywords, trailer keywords, payload keywords, and field keywords; and  
value keywords specifying value parameters of associated header keywords, trailer keywords, payload keywords, and field keywords.

22. A method of decoding a network frame having at least one protocol data unit, containing at least one field, comprising:
- receiving a protocol data unit name and a network frame having at least one protocol data unit;
  - retrieving protocol knowledge of the data structure of the at least one protocol data unit enabling the extraction of the at least one field;
  - extracting a value from the at least one field of the at least one protocol data unit; and
  - associating the value with at least one keyword.
23. The method of claim 22 wherein the at least one keyword at least one field keyword.
24. The method of claim 22 wherein the at least one keyword is a payload keyword and at least one field keyword.
25. The method of claim 22 wherein the at least one keyword is a header keyword and at least one field keyword.
26. The method of claim 22 wherein the at least one keyword is a header keyword, a payload keyword, a trailer keyword, and at least one field keyword.

27. A method of decoding a network frame having at least two protocol data units, one of the at least two protocol data units being a first layer protocol data unit and each of the at least two protocol data units containing at least one field and a protocol name identifying a next layer protocol, comprising:

receiving the name of the first layer protocol data unit and a network frame;

retrieving protocol knowledge of the data structure of the first layer protocol data unit enabling the extraction of the at least one field and the next layer protocol name;

extracting a value from the at least one field of the at least one protocol data unit;

extracting the next layer protocol name of the at least one protocol data unit; and

associating the value with at least one keyword.

28. Apparatus including a decoder for decoding a network frame, containing protocol data units, to a network, the apparatus comprising:

a user interface;

a network connection;

a decoder system disposed between the user interface device and the network connection, the decoder system including:

a protocol library having protocol knowledge of the data structure of at least one protocol data unit enabling the extraction of at least one field; and



a protocol decoder connected to the protocol library, the network connection, and the user interface for receiving a network frame, retrieving protocol knowledge from the protocol library, extracting a value from the at least one field of the at least one protocol data unit, and associating the value with at least one keyword.

29. The apparatus of claim 28 operable as a network analyzer.

30. Apparatus for decoding a network frame having at least one protocol data unit, containing at least one field, comprising:

means for receiving a protocol data unit name and a network frame having at least one protocol data unit;

means for retrieving protocol knowledge of the data structure of the at least one protocol data unit enabling the extraction of the at least one field;

means for extracting a value from the at least one field of the at least one protocol data unit; and

means for associating the value with at least one keyword.

31. A computer-readable medium whose contents cause a computer system to decode a network data frame, by a method comprising:

receiving a protocol data unit name and a network frame having at least one protocol data unit;

retrieving protocol knowledge of the data structure of the at least one protocol data unit enabling the extraction of the at least one field;

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